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Reinterpreting nineteenth-century accounts of whales battling 'sea serpents' as an illation of early entanglement in pre-plastic fishing gear or maritime debris

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Abstract
Entanglement of whales in active fishing gear and abandoned maritime debris is recognized to be a serious problem in contemporary marine conservation biology, one that is commonly believed to have its origin with the introduction of non-degrading plastic in the mid-twentieth century. As many sightings of purported sea serpents are now acknowledged to have been due to misidentified cetaceans, this anecdotal literature can provide a valuable resource for extending inferences about whale biology backward in time. This article examines this corpus of evidence to suggest that what have been mistakenly believed to have been sea serpents, sighted in both pre- and post-plastic time periods, were in fact sometimes entangled whales. Furthermore, and in particular, what were once a popular staple of nineteenth-century maritime lore – recountings of whales locked in mortal combat with sea serpents – are posited to be the earliest recorded observations existing of large cetaceans entangled in anthropogenic equipment or litter.

Keywords
entanglement, fishing gear, maritime debris, nineteenth century, sea serpents, whales

> The cook put his head out of the galley and shouted 'Whales boys! Look out for your nets'. Then to our horror, an enormous monster with a head like a Chinese dragon rose up from the waves alongside the ship. (Report from the steam trawler *Glengrant* off the coast of Scotland, published in the *Daily Express*, 14 September 1903)

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This epigraph conveniently links the three themes of this article: whales, fishing nets and imagined sea monsters.[1] Although the history of commercial whaling has been the subject of frequent study,[2] less is known about other factors that may have influenced the abundance of these cetaceans through time.

It is now widely acknowledged that we are residing in an era of environmental manipulation on a truly global scale: the 'Anthropocene'.[3] Massive alterations, for example, have taken place in the abundance and diversity of marine fauna in consequence of millennia of exploitative harvest and hunting.[4] Chemical pollution now encircles the planet,[5] and although some of the most remote oceanic areas may be technically classified as 'wilderness' through absence of human inhabitation, nowhere is really free of the scattering and flotsam of human waste.[6]

Entanglement in abandoned maritime debris and active fishing gear is recognized to be a serious conservation problem on a global scale that affects more than 200 species of marine animals, including many whales.[7] In particular, the notorious and ubiquitous drifting about of derelict fishing gear, often referred to by the ominous sobriquet of 'ghost nets', is meritorious of the public concern that it has received.[8] There is widespread belief that entanglement is a modern problem related to the advent of non-degradable plastic in the middle of the twentieth century,[9] with little or no occurrence

1. Paul Harrison, *Sea Serpents and Lake Monsters of the British Isles* (London, 2001).
2. Eric Jay Dolin, *Leviathan: The History of Whaling in America* (New York, 2008); Andrew Darby, *Harpoon: Into the Heart of Whaling* (New York, 2008).
3. William F. Ruddiman, 'The Anthropocene', *Annual Review of Earth and Planetary Science*, 41 (2013), 45–68; Jan Zalasiewicz, Mark Williams, Alan Haywood and Michael Ellis, 'The Anthropocene: A New Epoch of Geological Time?', *Philosophical Transactions of the Royal Society A*, 369 (2013), 1938.
4. Poul Holm, Tim Smith and David J. Starkey, eds., *The Exploited Seas: New Directions for Marine Environmental History* (St. John's, NFL, 2001); David J. Starkey, Poul Holm and Michaela Barnard, eds., *Oceans Past: Management Insights from the History of Marine Animal Populations* (London, 2007).
5. Robert L. France, *High Arctic Extreme Science: Environmental Research from the Trans-Ellesmere Island Ski Expedition* (Winnipeg, MB, 2010).
6. T. Benton, 'Oceans of Garbage', *Nature*, 352 (1991), 113; R. L. France, 'Garbage in paradise', *Nature*, 355 (1992), 504.
7. L. M. Philo, J. C. George and T. F. Albert, 'Rope Entanglement of Bowhead Whales (*Balaena mysticetus*)', *Marine Mammal Science*, 8 (1992), 306–11; A. Johnson, G. Salvador, J. Kenney, J. Robbins, S. Kraus, S. Landry and P. Clapham, 'Fishing Gear Involved in Entanglements of Right and Humpback Whales', *Marine Mammal Science*, 21 (2005), 635–45; R. M. Casoff, K. M. Moore, W. A. McLellan, S. G. Barco, D. S. Rotstein and M. J. Moore, 'Lethal Entanglement in Baleen Whales', *Diseases of Aquatic Organisms*, 96 (2011), 175–85; National Oceanic and Atmospheric Administration Marine Debris Program, *Report on the Entanglement of Marine Species in Marine Debris with an Emphasis on Species in the United States* (Silver Spring, MD, 2014) (hereafter NOAA, MD, *Report*).
8. NOAA, MD, *Report*.
9. J. G. B. Derraik, 'The Pollution of the Marine Environment by Plastic Debris: A Review', *Marine Pollution Bulletin*, 42 (2002), 842–52; M. R. Gregory, 'Environmental Implications of Plastic Debris in Marine Settings – Entanglement, Ingestion, Smothering, Hangers-On,

before that time.[10] In fact, documented incidences of entangled whales only date back to the late 1980s and early 1990s for many species.[11] The purpose of this article is to review the complete corpus of sea serpent sightings to advance an argument that in fact entanglement of whales has almost certainly been going on for much longer than is commonly believed.

There is a long history of conflating (see Figure 1), or misidentifying,[12] cetaceans as sea serpents. Herein, in order to build my case, I compile the relevant accounts from both the pre-plastic nineteenth century and the plastic-laden twentieth century, of what I believe to have been entangled whales that were mistaken for sea serpents. This is followed by accounts of putative sea serpents observed to be either tearing apart fishing nets or feeding upon a dead whale. I then move on to describe a series of dramatic and famous accounts of sea serpents from the nineteenth century, as well as several lesser-known cases from the early twentieth century, that were believed to have been observed locked in mortal combat with whales. The retelling of these accounts on wharfs and in the press around the world became a popular feature of nineteenth-century maritime lore, but in reality, I believe, they are almost certainly evidence for entanglement in pre-plastic fishing gear or abandoned debris.

The historical sources mined for the anecdotes included in the article include the two authoritative texts known for their comprehensive listing of all extant global sea serpent sightings.[13] In addition to these classic references, other anecdotes were obtained from more recent compendia of global and regional sightings.[14] Finally, more than a dozen other cryptozoology texts, published between 1883 and 2014, were consulted, but failed to reveal further illuminating anecdotes. As such, my survey of the corpus of literature can be considered to be complete, spanning the world's oceans over the period from the mid-seventeenth to the early twenty-first centuries. A total of 27 anecdotes are presented below, of which 19 occurred before the advent of plastic.

Hitch-Hiking and Alien Invasions', *Philosophical Transactions of the Royal Society B*, 364 (2009), 2013–25; United Nations Environmental Program, *Marine Debris as a Global Environmental Problem: Introducing Solutions Based Framework Focused on Plastic* (New York, 2011).

10. NOAA, MD, *Report*.
11. D. W. Laist, 'Impacts of Marine Debris: Entanglement of Marine Life in Marine Debris Including a Comprehensive List of Species with Entanglement and Ingestion Records', in J. M. Coe and D. B. Rogers, eds., *Marine Debris* (New York, 1997).
12. C. G. M. Paxton, E. Knatterud and S. L. Hedley, 'Cetaceans, Sex and Sea Serpents: An Analysis of the Egede Accounts of a "Most Dreadful Monster" Seen off the Coast of Greenland in 1734', *Archives of Natural History*, 32 (2005), 1–9; Gary J. Galbreath, 'The 1848 "Enormous Serpent" of the Daedalus Identified', *The Skeptical Inquirer*, 39, No. 5 (2015), 42–6.
13. A. C. Oudemans, *The Great Sea-Serpent: An Historical and Critical Treatise* (Landisville, PA, 2007 [1892]); Bernard Heuvelmans, *In the Wake of the Sea-Serpents* (New York, 1968).
14. Loren Coleman and Patrick Huyghe, *The Field Guide to Lake Monsters, Sea Serpents, and Other Denizens of the Deep* (New York, 2003); Harrison, *Sea Serpents*; J. P. O'Neill, *The Great New England Sea Serpent, An Account of Unknown Creatures Sighted by Many Respectable Persons Between 1638 and the Present Day* (Camden, ME, 1999).

Figure 1. Was the unidentified marine object that swallowed Jonah a 'whale' (Matthew 12:40), a 'great fish' (Jonah 1:17), or a sea serpent as popularized in medieval art such as this mosaic from the fourth-century basilica at Aquileia?
Source: © Robert France.

Background

Sea serpents misidentified as possibly entangled cetaceans

There are 17 accounts in the literature concerning sea serpents that were initially identified as being large cetaceans, which I believe to be consistent with my thesis of entanglement in fishing gear or maritime debris. These accounts are ordered below from what was considered to be a sighting of a new species of mystery cetacean, to initial impressions thought to have been of whales but which were then later altered, to specific referrals to a resemblance to whales, and finally to the somewhat surprising failures to even countenance whales as being possible candidates for the observed 'unidentified marine objects', or 'UMOs'.

In 1867, off the coast of Chile, the crew of the *Magenta* spotted an unknown whale with two prominent dorsal fins, a novelty given that all whales, those extinct or alive today, have only one such. A naturalist on board wrote:

> The general contour of the body, viewed from above, was elongated; the posterior region in back of the second dorsal fin was very narrow and streamlined before being lost in the lobes of the tail, which was of discrete dimension and of usual shape. (Anecdote 1)

The whale also took no notice of a dinghy that was dropped. Cryptozoologists Coleman and Huyghe, who reported this incident, also mention briefly that similar whales sporting two dorsal fins had been observed in 1869 off the coast of Scotland, and in 1983 off the island of Corsica, and as a consequence, place this UMO in the category 'mystery cetacean'.[15] A much more likely explanation, however, is that the second dorsal fin is simply a piece of debris or fishing gear, such as a barrel float, that were commonly used at the time, that had become entangled on the anterior – and, indeed, *only* – fin. No need to invent a completely new phylogenetic order of cetaceans.

In 1898, while in a sloop off the coast of Maine, Albert Wass reported, in a letter written many years later, seeing what he and his companion imagined to be a sea serpent, but which in reality, I believe, is one of the best descriptions we have of a nineteenth-century entangled cetacean:

> [We] were on board … when a black object having the appearance of a ledge just awash, or a whale's back loomed up at less than a quarter of a mile ahead. We could see and hear what seemed to be a spar buoy with its base held stationary, spanking its length on the surface of the water with a circular motion, at varying intervals of from two to five seconds.
>
> At first we thought it must be a whale being attacked by a thrasher or swordfish, but, on nearer approach, we were convinced that it was something different from what we had ever encountered. When we had reached a proximity of about 100 yards (and, believe me, that was close enough!), the monster straightened itself out to a form resembling a seventy-five-feet string of hogsheads … the motion of its swimming was like an eel, and its speed, at least, twenty knots. The absence of fins and the eel-like shape of the tail settled all doubt that this could be any known type of whale.[16] (Anecdote 2)

In this UMO sighting, we have what seems to be a whale with an elongated, crenulated body that is specifically likened to a string of buoys or hogshead barrels, and which can alternatively curl up upon itself or move forward at great rapidity. Also of interest is the first impression that the sighting might have been of a whale being attacked by another sea creature.

In 1902, in the equatorial Atlantic, the crew of the *Fort Salisbury* observed an UMO in the middle of the night, as reported by the second officer:

> Dark object, with long, luminous trailing wake, thrown in relief by a phosphorescent sea, seen ahead, a little on the starboard bow … Concluded dark mass was a whale … On drawing nearer dark mass and [phosphorescent] lights sank below the surface. Prepared to examine the wake in passing with binoculars.

15. Coleman and Huyghe, *Field Guide*, 131.
16. Reprinted in O'Neill, *The Great New England Sea Serpent*, 147.

> Passed about forty to fifty yards on port side of wake, and discovered it was the scaled back of some huge monster slowly disappearing below the surface. Darkness of the night prevented determining its exact nature, but scales of apparently 1 ft. diameter and dotted in places with barnacle growth were plainly discernible. The breadth of the body showing above the water tapered from about 30 ft. close abaft where the dark mass had appeared to about 5 ft. at the extreme end visible. Length roughly about 500 ft. to 600 ft.
>
> Concluded that the dark mass first seen must have been the creature's head.[17] (Anecdote 3)

What was imagined to be 'the creature's head' was obviously a whale, given the described immense cranial dimensions of '30 ft'. And here, as I believe elsewhere in the sea serpent literature, identification of 'scales', in this case being a foot in diameter, strongly implies entangled gear or debris, probably fishing net floats, being pulled along behind. And needless to say, there is not, nor has there ever been, any marine animal of such a fantastic length of two hundred metres, in other words, six times the length of a blue whale! Heuvelmans comments upon the 'much overestimated' length and 'equally fantastic width' of the creature's head, before completely rejecting the *Fort Salisbury* account due to the night-time conditions of the sighting.[18] Or so he states, but one does wonder whether the real reason for the dismissal is that it is impossible to fit this account into the conceived taxonomic framework of sea serpents that he develops in his book. So here, we have an example of cryptozoology – indeed, Huevelmans is considered to be the father of the 'discipline' – blatantly displaying data selection in order to suit his confirmation bias, rather than interpreting the observation with a more parsimonious explanation, in other words via 'Occam's razor'.

When, in 1903, the *Glengrant* returned to a Scottish port from fishing in the North Sea, her crew had a story to tell about a fearful encounter with an angry UMO that captured the interest of readers following its publication in several newspapers. Following a cry of 'whales', the crew watched a huge body make its way toward their steamer. Parts of the creature were seen to be above the water, 'swaying' to and fro, before the 'monster' dragged its two hundred foot 'long sinuous body' underneath the fishing vessel, actually raising the latter up during the process. The UMO moved at great speed, its undulations 'wriggling like a serpent', and having a horse-like head that sported a long mane that flowed down the back of the creature (Anecdote 4).[19] It is not hard to consider this as being a large whale swimming underwater, oblivious to what its dragged chain of 'long sinuous' material was doing upon the surface. The long, flowing 'mane' down the back of the UMO suggests an entangled fishing net.

The Dutch steamer *Amsteldijk* was crossing the North Atlantic in 1911 when the second officer wrote the following in the ship's log:

> An animal was observed which was very probably a sea-serpent. Our attention was suddenly drawn by something hitting the sea fairly violently; about 60 yards to port a great mass of foam was seen, in the middle of which was a dark coloured sea-animal. Altogether it was very like a *Noordkaper* [North Atlantic right whale] but without a dorsal fin.

17. Reprinted in Heuvelmans, *In the Wake of the Sea-Serpents*, 367.
18. Heuvelmans, *In the Wake of the Sea-Serpents*, 368.
19. Harrison, *Sea Serpents*, 187.

> A few seconds later a body suddenly lifted above the water and rose about 8 feet above the surface; 30 feet further of the back of the sea-animal could be seen. After it had shown itself for ten seconds in this position, it fell back into the water, hitting it violently, and then disappeared into the depths and was seen no more.
>
> This colossus was about 2 feet six inches in diameter (that is in the part out of the water). A large proportion of the part that emerged seemed to belong to the head and sank progressively with the body. The diameter of the head seemed to our eyes to be a little greater than that of the rest of the visible part. The back was dark in colour, while the ventral part was much lighter.[20] (Anecdote 5)

Tweaking the well-known 'duck test': if it looked like a right whale, and it acted like a right whale, then it most probably *was* a right whale. The small diameter of the 'serpent's' tail, its elevation in the air as the whale breached or threw up its tail in preparation for a dive, and it being pulled down into the water by the plunging cetacean, all bespeak of entanglement, to which, sadly, this species of endangered cetacean is now known to be particularly prone.

Confusing whales with sea serpents has continued into recent, plastic-laden times, as, for example, in 1960, off the East Anglian coast, when five witnesses observed an UMO, one stating that he 'had no idea what it could be' while another stated that she at first 'thought it was a whale'. Others thought it resembled a torpedo or a submarine, but to Harrison 'this creature once again takes the form of an archetypal sea serpent: "it was just a long black line on the surface about nine or ten feet long … It's hard to say what speed it was doing, but it was very fast … The thing looked perfectly flat"' (Anecdote 6).[21]

Thirty miles off Nantucket in 1964, the crew of the *Blue Sea* saw what they at first thought was a whale, provoking them to follow the UMO. Heuvlemans describes the encounter:

> But when they got closer, they realized that it wasn't. It was black and at least 50 feet long. It had several humps, and there was a 'blowhole in the top of the alligator-like head'; it seemed to 'skim along the top of the water' at about 8 knots. Several days later a second sighting took place: 'The body was deep blue or blackish and 'where the neck joined the body was irregularly scalloped' … It had a light grey dorsal projection, triangular in shape and rounded at the top. This was about 4 feet long and meaty looking. On the back were two blow-holes, pear shaped or oval.[22] (Anecdote 7)

The observation of blowholes gives the UMO away as a cetacean, as does the description of the 'irregularly scalloped' body that was seen to 'skim along the top of the water' at a rapid pace, strongly suggesting gear or debris entanglement.

Off the coast of Cornwall in late December 1975, a witnesses observed what she first thought to be a dead whale until 'it started to move away smoothly'. The four-metre

20. Reprinted in Heuvelmans, *In the Wake of the Sea-Serpents*, 378.
21. Harrison, *Sea Serpents*, 62.
22. Heuvelmans, *In the Wake of the Sea-Serpents*, 527.

length and presence of an elongated neck led her to conclude that it was not 'like any creature seen round here' (Anecdote 8).[23] A few weeks later, and in another location along the coast, another individual observed a dark hump which he first thought to be the back of a whale before 'a long neck reared up out of the water', the combined length of the UMO being around 30–40 feet (Anecdote 9).[24] And then, five months later, a Falmouth fisherman and his friend observed the following:

> I looked over the starboard side and saw this thing in the water. I thought it was a boat upside down. We went over to investigate and it looked like the back of a dead whale but with three humps, and was about 18–20 feet long. The body was black but a lighter colour under water. Then suddenly this head came out of the water, about three feet from the body … Then the head vanished and the body sank away.[25] (Anecdote 10)

In all three cases, the presence of the long neck could very well be a line of buoys thrown up into the air by the locomotive actions of a, or possibly, the (same) whale. Twenty-three years later, in the same location, two fishermen had a similar encounter, this time describing it in a way more familiar to a classic case of cetacean entanglement:

> [We saw] a huge semi-circular shaped mound rise from the water, [when they] were about a mile off shore. Initially I thought it was a dead body rising to the surface. As we watched the mound, it dropped back under the water, causing a terrific swell. Moments later it resurfaced, about fifty yards from our boat. I could now see that it was no dead body, but a large creature. My son thought it was the back of a whale as this was the most logical explanation we could find. Our opinions altered when, about ten yards in front of the mound, a small head appeared above the surface. The head lifted out of the water only very slightly but sufficient for us both to see part of what seemed a long slender neck. It then dropped back down and the whole thing submerged in a colossal water disturbance.[26] (Anecdote 11)

In 1993, off the northeast coast of England, a witness observed a great commotion and disturbance in the water before a 'great dark hump' emerged, leading him to imagine it was a whale, that is before, a 'periscope-like head and neck' stuck up out of the water about a metre distant from the breaking body. As recounted in Harrison:

> There seemed to be some kind of water disturbance on the side of the hump or breaking body I could see. From the size of body parts I saw, it must have been about thirty feet long, dark brown in colour, and had a neck which stood about three feet tall of the water … The head looked like that of an eel and was the same circumference and size as the neck. It seemed to look round, and in one movement flopped forward, dropping its neck and head into the water, disappearing in a huge foam of water.[27] (Anecdote 12)

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23. Harrison, *Sea Serpents*, 95.
24. Harrison, *Sea Serpents*, 96.
25. Harrison, *Sea Serpents*, 97.
26. Harrison, *Sea Serpents*, 101.
27. Harrison, *Sea Serpents*, 93.

The witness concludes by stating that, shaken up by what he had seen, he quickly made for 'the safety of the shore'. And so here we have yet another anecdote about what is first thought to be a whale until a long and narrow attachment is viewed, which is likened to being an eel-like neck and head. This then leads, in a big jump in logic, to a conclusion that a sea serpent has been spotted, rather than a much more mundane consideration of a whale being entangled in a train of some sort of gear or debris.

Next in the progression of sightings is one recorded by Heuvelmans from 1898 in south Asia, in which the observers, to quote Polonius, believe the spotted UMO to be 'very like a whale' without, however, actually being so in their limited, Horatio-esque dreams of all that is possible:

> We saw it only once from close to, and there can be no doubt about it. The appearance of the beast is as follows: a round black fat body like that of a big whale, then a *sinuous* part, not emerging completely, but seeming to join the body to the head. The latter fairly large, continuing the neck, of rather oval shape, and with two gaping holes. Finally a set of dorsal spine-like saw-teeth.[28] (Anecdote 13)

As with the sighting of the *Blue Sea* above, the description of 'a set of dorsal spine-like saw-teeth' suggests an entangled string of gear or debris.

In 1882, off the coast of Scotland, the crew of the *Bertie*, 'said to be men of more than average intelligence', encountered an UMO with 'a huge head covered with barnacles as large as herring barrels; a prodigious square mouth, with whiskers seven or eight feet long' that was making straight towards them:

> On rising to the surface he had blown, but not like any ordinary whale, which these men were used to seeing. Three hillocks, each about the size of a six-oared boat, with water between them … was next seen passing under their craft. The next moment the monster rose and was approaching the craft with a cavernous mouth, so very wide open that it seemed capable of swallowing the boat and all on board in one gulp.[29] (Anecdote 14)

The encounter continues with the crew pelting the UMO with ballast stones that simply bounced off its surface 'like marbles' followed by firing a double shotgun into its mouth, which did not dissuade it from following the craft for several hours. The crew reported that the UMO 'had two fins, apparently as large as their mainsail … stretched up from his back or sides' and the only resemblance that the creature bore to a whale was its tail, which they were sure would have measured forty feet across. Clearly, this is a description of a large whale pulling some sizeable pieces of debris which were, of course, impervious to damage by stones or shot. Eight-foot-long 'whiskers' suggest an entangled fishing net.

Finally, there are three sea serpent sightings in which the observers, quite surprisingly – but then there is no underestimating the power of confirmation bias in terms of shaping eyewitness testimonials – do not even consider the possibility of the UMOs as having anything to do with cetaceans, despite evidence to the contrary, as illustrated in their own words. Take, for example, the 1870 account in the *Pall Mall Gazette*, in

28. Heuvelmans, *In the Wake of the Sea-Serpents*, 142.
29. Harrison, *Sea Serpents*, 184.

which Captain Joshua Slocum and the crew of American schooner *Saladin* reported what they saw in the Caribbean:

> It is described as being 100 feet in length, its body measuring forty and its tail sixty feet. The most curious feature about it was an immense body of hard gristly matter, twelve feet in height, forty feet in width, with the same length, entirely void within, forming a large bladder-shaped balloon, which, filled with air, buoyed the serpent on the water. This oval body had regular ridges, running from the apex or head (for this bladder preceded the body of the fish) to where it joined the main body. These ridges extend fore and aft at intervals of four inches, with a regular height of two inches, and gave to the surface the appearance of the network of a balloon. The bladder portion was elastic and yielded to the movement of the sea; it was two inches thick, but of hard, dense, impenetrable character, and would resist knife or bullet. On each side of this floating dome were two heavy paddles, each five feet long, by which the monster made progress. The fish proper, which was but an appendage tailed on to this blown-up bladder, consisted of a heavy fishy substance, with brown sides; and about ten feet from the dome were two eyes, one on either side of a large horn. From this point the fish tapered on to a forked tail of material as heavy and hard as iron. Captain Slocum declares that the tail would weight 100lbs. to the cubic foot, and the forks of the tail stood horizontally in the water, but submerged four feet, the rest of the monster 'sitting lightly on the ocean wave'.[30] (Anecdote 15)

For Heuvlemans, this is a case of simply misidentifying a dead rorqual whale floating belly up, displaying its characteristic furrowed underside, and 'swollen by putrefaction perhaps even some digestive trouble'.[31] This certainly seems a plausible and even likely explanation for the first body part of the UMO, but what about the rest of the creature, the 'appendage tailed on to this blown-up bladder' composed of a hard substance? This, I would suggest, is a string of entangled gear or debris. Even the mysterious 'large horn' can be easily explained as being a marlin spike used to tie together pieces of rope and fishing gear, as was specifically likened to in several of the famous Gloucester sightings of 1817,[32] which I have interpreted as being evidence for entanglement.[33] For the present example, the fact that the imagined monster still 'made progress' by its 'two heavy paddles, each five feet long', suggests that this might be the very first historical snapshot we have of a cetacean being observed in the process of actually dying from the ramifications of entanglement.

Heuvelmans goes on to recount another sighting that he considers to be a misidentified whale, in this case what I believe to be as one further along in the sometimes fatal chain of repercussions resulting from entanglement. In 1880, off the Maine coast, the crew of the *Chalcedony* saw what the captain considered to be 'the original sea serpent', presumably referring to that sighted six decades previously in Massachusetts.

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30. Reprinted in Heuvelmans, *In the Wake of the Sea-Serpents*, 222.
31. Heuvelmans, *In the Wake of the Sea-Serpents*, 223.
32. O'Neill, *The Great New England Sea Serpent*; Wayne Soini, *Gloucester's Sea Serpent* (Charleston, SC, 2010).
33. R. L. France, *Disentangled: Environmental History and Explanation of the World's Most Sighted and Studied Sea Serpent* (forthcoming).

> It was dead, and floated on the water, with its belly, of a dirty brown color. Its head was at least 20 feet long, and about 10 feet through at the thickest point. About midway of the body, which was, I should guess, about 40 feet long, were two fins, of a clear white, each about 12 feet in length.

The next bit of the account (Anecdote 16) supplies evidence as to what might have caused the death of what was obviously a whale:

> The body seemed to taper from the back of the head down to the size of a small log, distinct from the whale tribe, as the end had nothing that looked like a fluke. The shape of the creature's head was more like a tierce than anything I can liken it to. I have seen almost all kinds of shapes that can be found in these waters, but never saw the like of this before.[34]

And here, we may have the 'smoking gun' in terms of what may possibly be the first historical record of a whale's death due to entanglement; that is, a 'tierce' is a very large cask, bigger than a barrel, and a string of entangled gear or debris does not of course end in a fluked tail.

And then there is the report from the officers and men of the HMS *Philomel* about an incident observed during their 1879 transit of the Gulf of Suez:

> When first observed it was rather more than a mile distant on the port bow, its snout projecting from the surface of the water, and strongly marked ripples showing the position of the body. It then opened its jaws, as shown in the sketch [Figure 2], and shut them again several times, forcing the water from between them as it did so in all directions in large jets. From time to time a portion of the back and dorsal fin appeared at some distance from the head. After remaining some little time in the above-described position, it disappeared, and on coming to the surface again, it repeated the action of elevating the head and opening the jaws several times, turning slowly from side to side as it did so. On approach of the ship the monster swam swiftly away, leaving a broad track like the wake of a ship, and disappeared beneath the waves … The inside of the mouth appeared to be grey with white stripes, parallel to the edges of the jaw, very distinctly resembling whalebone.[35] (Anecdote 17)

It is of no reach to conclude from this description and the accompanying drawing that this is a case of bandwagon jumping along the all too common lines of 'I too saw a sea serpent'. Heuvelmans refers, snidely, to what at first blush 'looks very new—at least for a sea-serpent', before rightly dismissing the encounter as having nothing to do with sea serpents: 'Personally I should not like to swear that the *Philomel* monster was not a large whale of a known species'.[36] Of course, but what about the extensions shown in the drawing, presumably created from eyewitness testimonies? Is that finned hump displayed above the water merely the back of the same or perhaps of another cetacean? After all, breaching, whether it be for mating, predator warning, or notification of food, is often a communicative behaviour displayed in association with other whales. Most importantly,

34. Heuvelmans, *In the Wake of the Sea-Serpents*, 223.
35. Reprinted in Heuvelmans, *In the Wake of the Sea-Serpents*, 283.
36. Heuvelmans, *In the Wake of the Sea-Serpents*, 283.

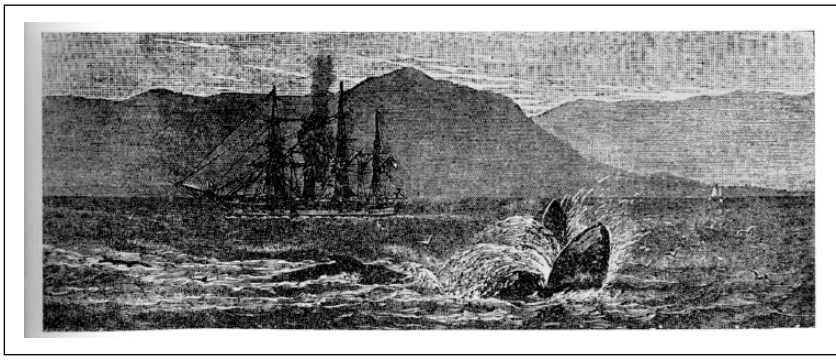

Figure 2. A purported sea serpent that resembles a breaching whale, possibly a proximal second whale or the extended body of the former, and perhaps a piece of trailing entangled gear or debris. See Anecdote 17 in text. Sighting from 1879 in the Gulf of Suez.
Source: Bernard Heuvelmans, *In the Wake of the Sea-Serpents* (New York, 1968).

how about the last little bit trailing off to the left side of the drawing, 'at some distance from the head'? Could it be a piece of gear or debris that has become entangled and dragged behind the breaching, and, possibly in this case, solitary feeding whale?

Encounters between sea serpents and fishing nets

The *Dundee Advertiser* carried an article in 1903 about an encounter in which the actions of an UMO, exhibiting marked whale-like features, was believed to have resulted in the destruction of fishing nets:

> The sea serpent or some terrible imitation thereof has again made its appearance on the coast of Shetland … [Mr. Jamieson] had not proceeded far when, to his amazement and horror, he saw rising out of the water and a short distance from his boat, a sea monster about 30 feet long. In appearance, it was like a boat's sail and on its head or snout there was an enormous flipper-like appendage … Mr. Jamieson's story is collaborated by the crew of a fishing boat *Adelong*, which for successive nights saw the monster … The animal destroyed ten of their nets.[37] (Anecdote 18)

The large size indicates the UMO to have been a whale, and the presence of an enormous flipper near what was imagined to be the head of the animal suggests that the rest of the body might have been, as described in other accounts, composed of a train of gear or debris. This would make sense if in fact the whale was responsible for destroying the nets as believed. One wonders if the description of the body resembling a sail might refer to a piece of entangled debris.

In 1912, off the coast of New England, the crew of the fishing boat *Philomena* had their nets ruined by a sea serpent. As initially run in the *Gloucester Daily Times*, the account is significant, and to my knowledge unique in the sea serpent literature, in its use of the word 'entangled':

37. Reprinted in Harrison, *Sea Serpents*, 174.

> A small school of mackerel in the seine boat were pulling in the seine when a commotion was noticed among the fish, and the sea serpent, which had evidently been under the seine, made its appearance alongside the boat to the alarm and disgust of the crew, who had never seen anything like it before … It became entangled in the seine, tearing it to pieces, and then started off at a 2.40 gait with the boat, seine and everything in tow, all the mackerel estimated at about 40 barrels, getting away … Captain McKinnon describes the sea monster as being from 50 to 60 feet in length, its body which resembled in size and shape an immense tree trunk being black with rough skin covered with barnacles. It had what the fishermen call a hammer head and an immense fin on the back resembling a leg of mutton sail and nearly as large.[38] (Anecdote 19)

After receiving assistance from other nearby boats, the UMO was stabbed and cut adrift. A leg-of-mutton sail is used on small dories. The size, colour, encrustation with barnacles, pursuit of mackerel, strength to pull a laden dory, and location in the cold waters of New England imply that the UMO was a whale, not a whale shark. O'Neill, a believer in sea serpents, including the possibility of one in this particular account, nevertheless hits the mark with her interpretation of the event: 'Perhaps the creature [whatever it might have been] is unable to see the net and becomes entangled as it swims up on a closely packed meal'.[39]

Sea serpents feeding on a whale, presumed to be dead

In 1999, on the northwest coast of Norway, a 90-foot-long, 4.5-feet-wide creature was seen in association with what was thought to be a whale carcass:

> After passing [Mr.] Molvaer, the animal detected the whale carcass and dragged it away from the shore, 'at great a speed,' according to Molvaer, who was astonished at its strength and agility. As the animal began feeding on the whale carcass far out in the fjord, Molvaer, looking through his binoculars, was able to observe vertical undulations. When Molvaer returned with his video camera and his son, the animals was still eating the carcass. In fact … the video actually shows two animals feeding off the whale carcass, from opposite angles.[40] (Anecdote 20)

The sudden and unexplained splitting of a single sea serpent into two animals 'feeding' on what is obviously still a very alive whale from 'opposite angles' reads like an unfortunate cetacean being glimpsed in a struggle with strands of entangled gear or debris. I believe that this is further suggested by the small diameter, undulating motion, and agility of the UMO body and behaviour.

Accounts of sea serpents battling cetaceans

The sea has always been a foreign, mysterious and occasionally scary place, the abode of '*Hic sunt dracones*'. A common leitmotif of early maps and lithographs was the image of brave sailors and their vulnerable ships being locked in ferocious battle with all manner

38. O'Neill, *The Great New England Sea Serpent*, 165.
39. O'Neill, *The Great New England Sea Serpent*, 167.
40. Coleman and Huyghe, *Field Guide*, 71.

of denizens of the deep.[41] Likewise, it is not difficult to find images of imagined combat between sperm whales and 'kraken' or giant squids. And, of course, one of the most dramatic scenes in Jules Verne's widely popular 1864 novel *Journey to the Centre of the Earth* is of battling sea monsters, particularly a prehistoric Ichthyosaurus and a Plesiosaurus. No surprise then that at least four accounts exist purporting to describe antagonistic encounters between large cetaceans and imagined giant sea serpents. If entangled fishing gear or maritime debris can be misinterpreted as sea serpents feeding on cetaceans, it is not a stretch to invoke the same illation for reinterpreting accounts of confrontation between whales and imagined monsters.

In 1818, off New England, the master of the Packet *Delia* observed a sea serpent 'engaged',[42] or 'battling',[43] a large humpback whale. As O'Neill describes:

> Although he swore his testimony before Kennebec County (Maine) justice of the peace Ariel Mann on June 27, this report is considered by some to be suspect, in part because the creature is said to have raised its head and tail simultaneously twenty-five and twenty feet, respectively, in the air.[44] (Anecdote 21)

Sixty-nine years later and a little further north along the coast, two vacationers observed a 'long, black creature' at night: 'The animal caused such phosphorescence in the water that a crowd gathered and subsequently witnessed the creature in combat with "some sort of fish" for a quarter of an hour before both disappeared' (Anecdote 22).[45] The next morning a dead whale was found on a nearby sandbar, its flesh 'torn and gashed'. Unfortunately, no mention was made of whether the whale bore any entangled debris or gear that can sometimes scar an animal in such a manner.

The *Ville de Rochfort* was crossing the Gulf of Mexico in 1840 when the captain reported an intriguing UMO:

> [We saw something like a] long chain of enormous rings, resembling a number of barrels linked together, and in the form very like the back of a silkworm … As the ship approached … we presently saw the extremity of an enormous tail, longitudinally divided into two sections, white and black. This tail appeared to wind itself up, and repose on a part of the object itself. Then, at the other extremity, we saw a membrane rising to the height of about two metres from the water, and inclining itself at a considerable angle upon the mass (without leaving it, however): and this led me to conjecture that the monster before us was provided with an apparatus for the purpose of respiration … At last we perceived something like an antenna rising from the water, to the great height of nearly eight metres, terminated by a crescent at least five metres from one extremity to the other.[46] (Anecdote 23)

41. James B. Sweeney, *A Pictorial History of Sea Monsters and Other Dangerous Marine Life* (New York, 1972); Joseph Nigg, *Sea Monsters: A Voyage Around the World's Most Beguiling Map* (Chicago, IL, 2013); Chet Van Duzer, *Sea Monsters on Medieval and Renaissance Maps* (London, 2014).
42. Oudemans, *The Great Sea-Serpent*.
43. Heuvelmans, *In the Wake of the Sea-Serpents*.
44. O'Neill, *The Great New England Sea Serpent*, 56.
45. O'Neill, *The Great New England Sea Serpent*, 143.
46. Oudemans, *The Great Sea-Serpent*, 198.

In 1879, while aboard the steamship *Kirushiu-maru*, off the southern coast of Japan, the captain and chief officer saw what Heuvelmans describes as 'a new single combat between a big whale and what … [was] thought was a sea-serpent':

> The chief officer and myself observed a whale jump clear out of the sea, about a quarter a mile away. Shortly after it leaped out again, when I saw there was something attached to it. Got glasses, and on the next leap distinctly saw something holding on the belly of the whale. The latter gave one more spring clear of the water, and myself and chief then observed what appeared to be a large creature of the snake species rear itself about thirty feet out of the water. It appeared to be about the thickness of a junk's mast and after standing about ten seconds in an erect position, it descended into the water, the upper end going first. With my glasses I made out the colour of the beast to resemble that of a pilot fish.[47] (Anecdote 24)

Most interestingly, accompanying the original article published in the periodical *Graphic* were two sketches (see Figure 3).

Captain Drevar and the crew of the barque *Pauline* were bound for Zanzibar in 1875 when, off the northeast coast of Brazil, they observed an epic combat – a 'duel to the death' as one commentator would later phrase it – between a sea serpent and a sperm whale. Upon reaching the British Naval Stores in Zanzibar, the observed battle became the talk of the wharf, so much so that it attracted the attention of Revered E. Penny, who interviewed the witnesses and recorded details of the sighting and drew a sketch of the encounter (Figure 4), both of which he mailed off to the *Illustrated London News* for publication. With the subsequent translation and republication in Europe, the *Pauline* incident became the most famous sea serpent sighting of its day. One article, in the *Daily Telegraph*, was filled with purple prose worthy of Jules Verne, including statements that 'The ribs of the ill-fated fish [i.e. the embattled whale] were distinctly heard cracking one after the other, with a report like that of a small cannon; its bellowing ceased', causing the crew to be 'struck … aghast with terror'.[48] Another article in the *Graphic* contained an additional rendering of the encounter (Figure 5). By now, the barque was on its way to Burma, and Captain Drevar was forced to pen a retort in a Calcutta newspaper in which he blasts the *Telegraph* for its exaggerations which, as his relatives had written him, had ridiculed his reputation. Two years later, the *Pauline* returned to England, from where the interest began anew with publication of details in more than half a dozen periodicals, including the journal *Nature* and the *Illustrated London News*, the latter including the dramatic sentence: 'The serpent whirled its victim round and round for about fifteen minutes, and then suddenly dragged the whale to the bottom head first'.[49]

Immediately upon disembarking in Liverpool, Captain Drevar and members of his crew sought out a Justice of the Peace and filed sworn testimonials about the truth of their observation of the battle between the whale and the sea serpent. The most detailed account of the famous encounter comes from the Captain's log-book, which was published in the *Graphic*:

47. Heuvelmans, *In the Wake of the Sea-Serpents*, 281.
48. Reprinted in Heuvelmans, *In the Wake of the Sea-Serpents*, 264.
49. Reprinted in Heuvelmans, *In the Wake of the Sea-Serpents*, 264.

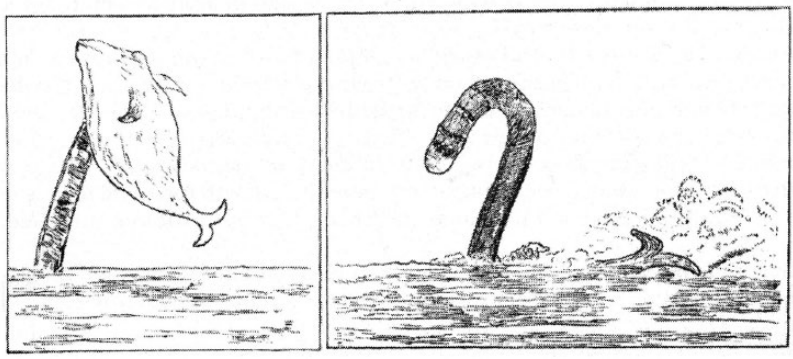

Figure 3. Depictions of a purported sea serpent attacking a whale that resembles (left drawing) a normal breaching whale with a thick line of debris entangled over its right fin, and the same whale moments later heaving the entangled gear or debris upward into the air while raising its tail to plunge back into the water (right drawing). See Anecdote 24 in text. Sighting from 1879 off the coast of Japan.
Source: A.C. Oudemans, *The Great Sea Serpent* (Landisville, PA, 2007 [1892]).

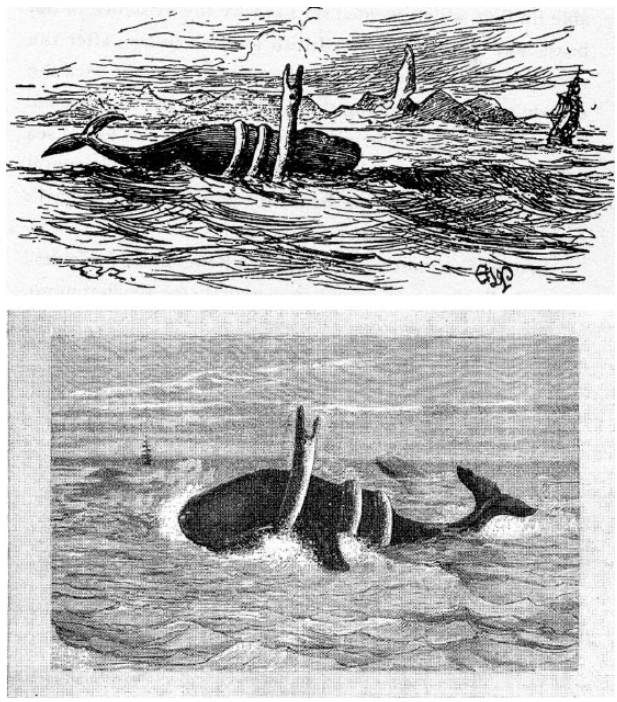

Figure 4. The most famous account of a cetacean observed to have been locked in mortal combat with a purported sea serpent, or simply a long string of entangling gear or debris wrapped around an unfortunate sperm whale? See Anecdote 25 in text. Brazil sighting from 1875.
Source: A.C. Oudemans, *The Great Sea Serpent* (Landsville, PA, 2007 [1892]) for upper image, and John Gibson, *Monsters of the Sea: Legendary and Authentic* (London, 1890) for lower image which also shows the other nearby whale in the background.

Figure 5. Another representation of the same encounter of a cetacean battling an attacking sea serpent. Note how this artist crooks both ends of the long unidentified marine object to make it appear to more closely resemble a snake's head and tail than the original drawing shown in the previous figure. Brazil sighting from 1875.
Source: A.C. Oudemans, *The Great Sea Serpent* (Landisville, PA, 2007 [1892]).

> At first glance I took all to be breakers as the sea was splashing up fountain-like about them, and the pillar a pinnacle rock, bleached with the sun; but the pillar fell with a splash, and a similar one rose. They rose and fell alternatively in quick succession, and good glasses showed me it was a monstrous sea-serpent coiled twice round a large sperm whale. The head and tail parts, each about thirty feet long were acting as levers, twisting itself and victim around with great velocity. They sank out of sight about every two minutes, coming to the surface still revolving; and the struggles of the whale and two other whales, that were near, frantic with excitement, made the sea in their vicinity like a boiling cauldron; and a loud and confused noise was distinctly heard. This strange occurrence lasted some fifteen minutes, and finished with the tail portion of the whale being elevated straight in the air, then waving backwards and forwards, and lashing the water furiously in the last death struggle, when the body disappeared from our view, going head downward to the bottom, where no doubt it was gorged at the serpent's leisure; and that monster of monsters may have been many months in a state of coma, digesting the huge mouthful. Then two of the largest sperm whales that I have ever seen moved slowly thence towards the vessel, their bodies more than usually elevated out of the water, and not spouting or making the least noise, but seeming quite paralysed with fear; indeed, a cold shiver went through my own frame on beholding the last agonizing struggle of the poor whale that has seemed as helpless in the coils of the vicious monster as a small bird in the talons of a hawk. Allowing for two coils round the whale, I think the serpent was about 160 or 170 feet long, and 7 or 8 feet in girth. It was in colour much like a conger-eel; and has the head, from the mouth being always open, appeared the largest part of its body.[50] (Anecdote 25)

Evidence, however, suggests that the death struggle was not fatal (to either creature), since, five days later, and a few hundred kilometres along the coast, the *Pauline's* crew were 'astonished to see the same or a similar monster … throwing its head and about 40 feet of its body in a horizontal position out of water as it passed onwards by the stern of our vessel'. When the 'Leviathan' started 'looking angrily at our vessel' as if preparing

50. Reprinted in Heuvelmans, *In the Wake of the Sea-Serpents*, 262; Oudemans, *The Great Sea-Serpent*, 254.

to attack 'we kept ready all our axes, to give it a warm reception. But the animal dived and disappeared'.[51] Given the widespread knowledge about the fate of the whale-ship *Essex*,[52] which became the foundation for Melville's *Moby-Dick*, one can perhaps understand the captain and crew's concern.

Such encounters continued into the early, still pre-plastic, years of the last century, when, for example, around 1910 off San Diego, a sea serpent was observed 'fighting with a whale. The serpent had wound its body around the whale twice, and as we neared it stuck its head and part of its body about thirty feet out of the water and calmly surveyed our approaching ship' (Anecdote 26).[53]

The captain and first mate of the ship *Kaiserin Augusta Victoria*, when off the coast of England in 1912, spotted a 20-foot-long, 18-inch-thick 'eel-like creature thrashing about on the surface of the water'. As Harrison recounts: 'it seemed to be in conflict with another sea animal, as it was violently whipping the water with its tail as though agitated by something below the water' (Anecdote 27).[54] As to what the embattled, submerged animal might have been, no indication was provided, though the diameter given for the UMO suggests a length of fishing net rope and small floats.

Interpretation

Cryptozoology hypotheses and parsimonious explanations

With respect to the *Delia* sighting, O'Neill believes that,

> because the packet was three-fifths of a mile from the combat, it is possible that what the fifteen to eighteen persons on board saw was *two* creatures in a struggle with the whale. Perhaps the creature(s), which were certainly neither prey nor predator of the humpback, were attempting to drive it off from a school of herring or mackerel, upon which both feed.[55]

O'Neil is of course correct that it could be 'neither prey nor predator' since the prey of humpback whales is plankton or small fish, and only humans are their predators. The two sea serpent hypothesis, however, calls to mind the confirmation bias of Anecdote 19. Alternatively, the noted and otherwise puzzling observation of the UMO's head and tail being simultaneously observed above the water is not difficult to explain if one supposes that what was seen was the humpback whale either struggling in attempt to try to free itself from entanglement or simply going about its business in feeding, diving or breaching irrespective to the trailing gear, in both cases the latter being occasionally thrown up into the air in the process. As for the 1887 'combat' (Anecdote 21), O'Neill posits an ecological interpretation: 'Descriptions of the New England creature [i.e. the presumed sea serpent] do not seem to suggest that any species of whale is a natural enemy; however, there could be rare instances in which the two might come into conflict, perhaps in

51. Reprinted in Heuvelmans, *In the Wake of the Sea-Serpents*, 263.
52. Owen Chase, *The Wreck of the Whaleship Essex* (New York, 1999).
53. Paul Leblond, John Kirk and Jason Walton, *Discovering Cadborosaurus* (Surrey, BC, 2014), 22.
54. Reprinted in Harrison, *Sea Serpents*, 190.
55. O'Neill, *The Great New England Sea Serpent*, 57.

a dispute over prey or in defense of their young'.[56] Although the first part of the sentence is indeed correct, there is no evidence from New England or anywhere else to countenance the second supposition.

In reference to the mysterious *Ville de Rochefort* sighting, Heuvelmans backs away from supposing that it was a sea serpent that had been seen. He suggests, instead, that the 'membrane' was merely a fin, and not 'an apparatus for the purpose of respiration', and goes on to state that 'the "antenna" and "crescent" could have been a big whale's tail, and the other tail which they saw "wind itself up" could have been the tentacle of a giant squid attacking the whale'.[57] It is worth noting, however, that incidences of giant squids observed 'attacking' whales are incredibly rare relative to the thousands of cases of cetaceans that have been observed entangled in fishing gear, or in this case, possibly maritime debris. The fact that the imagined serpent's tail, which resembled 'a number of barrels linked together' and which wound itself around and lay in 'repose' upon the body of the UMO all indicate entanglement. The 'antenna rising from the water' calls to mind the 'horn' seen in Anecdote 15, and is similar to the descriptions of similar 'horns' on the Gloucester sea serpent, which were likened to marlinspikes used to tie together pieces of fishing gear,[58] which they most probably were.[59] It is possible, as Heuvelmans contends, that the 'membrane' and 'crescent' were a fin or the tail of the whale. But given the obvious entanglement noted above, one wonders – and it would be hypocritical not to be cautious about raising the possibility – whether this might be a case of a cetacean dragging along debris from derelict sails or large net traps. Today, when one consults various online galleries containing photos of entangled whales, it is possible to see unfortunate cetaceans dragging all manner of billowy hoops, odd-shaped buoys, or other large pieces of anthropogenic bric-a-brac.

For the *Kirushiu-maru* sighting, Oudemans states elsewhere in his book that it was a porpoise and not a whale whose lateral fin was 'seized' by a sea serpent.[60] Despite his unsupported belief that it was a whale 'of the smaller kind' that was so engaged with a sea serpent, it must be said that the drawing looks quite like a typical breaching baleen whale. Oudemans makes a great ado about the colour of the UMO being similar to that in his pet theory of all sea serpents being long-necked seals; something which Heuvelmans resoundingly rejects. As for himself, Heuvelmans describes this incident as a whale being 'juggled' by a sea serpent. He cites an 1880 article in *Nature* wherein the author 'even thought that the whale's fluked tail was part of the same animal as the "swan-neck" in front of it, and thence deduced that the sea-serpent was a cetacean'. He then goes on to advance a cryptozoological explanation for the observation:

> They [the two drawings] show a baleen-whale fighting a sort of monstrous worm that could be a swan-necked sea-serpent, an enormous conger, or the arm of a giant squid. Since the long-necked sea-serpents are usually described as unaggressive, I incline towards the last alternative. This would explain why Captain Davison 'saw something holding on to the belly

56. O'Neill, *The Great New England Sea Serpent*, 230.
57. Heuvelmans, *In the Wake of the Sea-Serpents*, 178–9.
58. Soini, *Gloucester's Sea Serpent*.
59. France, *Disentangled*.
60. Oudemans, *The Great Sea-Serpent*.

> of the whale'. An animal that fights with teeth and jaws like a conger would have found a better grip on a fin.[61]

Rather than fighting a sea serpent, the drawings show the normal breaching behaviour of a whale with a piece of fishing gear, the 'thickness of a junk's mast' or about a half to one metre in diameter, attached to its right fin. The accompanying drawing is of a single creature – a cetacean – as the *Nature* contributor correctly concluded, depicting, I believe, the tail of the whale and the end of the string of entangled gear being thrown up in the air following the cetacean's plunge back into the water after its breaching shown in the first drawing.

Many interpretations exist for the famous *Pauline* sighting of the sperm whale and sea serpent confrontation. One contributor to a periodical at the time insisted that the whale was in mortal combat with a hitherto unknown species of giant boa or python adapted to marine life. Lee, however, makes a good point in dismissing such an idea that any serpent could elevate its body to one-third the height of the Monument to the Great Fire of London. He thought that perhaps it was a sea serpent that was sighted but also posited that the observers 'may have witnessed the amours of two whales, and have seen the great creatures rolling over and over', before going on to suggest that the 'supposed coils of the snake may have been the arms of a great calamari [i.e. giant squid], cast over and around the huge cetacean'.[62] Oudemans, in turn, dismisses Lee's conjectures as being unrealistic in that the amorous hypothesis does not explain the object encircling the whale. Furthermore, the circumference observed of the elongated object greatly exceeds that of any squid's arm (about a foot and a half), notwithstanding also that the terminus of the 'monster' was believed to have a mouth that was 'being constantly open', as reported in several of the periodicals. Oudemans then enters into a discussion about the violent nature of sperm whales before turning the encounter on its head by siding with the serpent in a remarkable, and quite ridiculous, bit of prose:

> Knowing the wild and angry nature of the warlike and pitiless sperm-whale, and the rather harmless character of the sea-serpent, we cannot believe that a sea-serpent has ever or will ever attack such a formidable antagonist. Every one will rather believe that a sperm-whale, when meeting a sea-serpent, would suddenly attack it. Moreover, if the sea-serpent was the attacker, it would not have had 'its mouth always open',—an unfailable sign of great pain—but would have bitten repeatedly the whale! And so I firmly believe that one of the three spermwhales, has seized with its colossal mouth a sea-serpent by the trunk. The poor defenseless sea-serpent with its enormous flexible body wound round the upper jaw and forepart of the quadrangular head of the spermwhale … The sea-serpent in its violent pain raised its long neck high in the air and extended its jaws; it is even probable that it uttered a roaring sound or shriek, this is not mentioned; it may have been drowned out by the dreadful noise caused by the fight of these two monsters, for we may suppose that the sea-serpent was not destitute of muscular strength, and must have been a formidable antagonist.

Oudemans continues in a similar vein, before questioning whether the coils of the serpent were wrapped twice around the whale, dismissing Reverend Penny's drawings as

61. Heuvelmans, *In the Wake of the Sea-Serpents*, 282.

'not worth our attention' as they had been created months after the encounter. He then discounts the suggestion by the captain that the serpent used 'its extremities as levers' during the fight, and believes it is 'more probable that the sea-serpent, feeling itself free for a moment, suddenly escaped, dived and was followed by the sperm-whale'.[63] Writing more than a half century later, Heuvelmans reviewed the evidence and concluded that the idea that the two encircling coils were the flexible neck of a prehistoric saurian or a mystery seal, as Oudemans had contended, was unfathomable. 'Personally I think,' he wrote, 'it was more likely some kind of giant eel', proceeding into a discussion about the powerful muscles of a wounded moray.[64]

The observations and facts do not support the contention that the whale was in battle with any creature. No giant species of marine snake or eel are known to exist approaching the estimated size of the UMO. Nor could any such creature, if one even did exist, structurally manage to lift itself up to such a height above the water, much less be capable of thrashing about, up and down, so quickly. In the absence of evidence to the contrary, prehistoric plesiosaurs or long-necked seals are known to exist only in the minds and writings of cryptozoologists. Nor does any extant vertebrate have a neck of such flexibility as to be capable of warping itself around the girth of a whale. And no known cephalopod has arms, which do display such flexibility, anywhere near the size noted for the circumference of the elongated UMO.

A much more likely explanation, and a parsimoniously satisfying one, is that what we have here, in 1875, is one of the very first observations of a whale spotted in the process of trying to disentangle itself from a long string of fishing gear or other maritime debris which has become wrapped around its body. In this regard, Captain Drevar's empathetic language is much closer to the mark when he refers to the 'poor' whale being caught 'helpless in the coils of the vicious monster', than is Oudemans' reference to the 'pitiless' whale attacking the 'poor defenseless sea-serpent'. Of all the commentaries and suggested hypotheses, one, from the German translator of several of the earlier articles,[65] comes closest to what I believe to have been the real circumstances underlying the observed event, when he posits that 'the whale was playing with a large tree or with a broken mast', notwithstanding, of course, the sad fact that entangled cetaceans are not at 'play' with their trailing detritus. It is heartening to note that, contrary to Captain Drevar's supposition of the whale being caught in a death embrace before it was dragged down to be feasted upon by the sea serpent, the unfortunate creature seems to have survived its entanglement long enough to have been spotted the following week and many kilometres away, though, of course, its long-term survival in such a, possibly debilitating, state might have been problematic.

Disentangling the composite cryptid

Glimpsed by thousands of New Englanders during the summers of 1817 to 1819, the Gloucester sea serpent remains the single most observed (exceeding that of all other

62. Henry Lee, *Sea Monsters Unmasked* (London, 1883), 142.
63. Oudemans, *The Great Sea-Serpent*, 257.
64. Heuvelmans, *In the Wake of the Sea-Serpents*, 282.
65. See Oudemans, *The Great Sea-Serpent*, 257.

sightings, both marine and freshwater combined) and thoroughly studied (investigated by numerous naturalists, scientists, and lawyers), aquatic cryptid in history. Because of this, it is worth comparing aspects of the present 27 cetacean-related sightings to that gold standard.

In mari multa latent, goes the old adage: 'in the ocean many things are hidden'. In a similar vein, Farma, the first to suppose, in a blog, that the 'great New England sea serpent' observed in Gloucester harbour was an entangled whale, supports her case with three eyewitness accounts in which the answer to identifying the hitherto UMO was 'hidden in the plain language of their own descriptions'.[66] Although, as I have argued elsewhere based on a more thorough examination of all the eyewitness testimonies (Table 1), that it is more likely that the UMO seen in Gloucester harbour might have been an entangled Bluefin tuna or some other fish, I hope I have shown the benefits accruing from such an approach of historical, textural reinterpretation.[67]

Paxton demonstrated that when anecdotes of anomalous phenomena, such as those pertaining to UMOs, are considered in aggregate, they can constitute data meritorious of legitimate scientific study.[68] In this regard, Table 2 shows the concordance between the observed physical and behavioural attributes from the sightings described in the present article, with those attributed to the purported Gloucester sea serpent, as summarized in my research findings.[69]

In toto, in terms of anatomy, the composite UMO described in the anecdotes compiled herein has a highly flexible body of considerable length that is tubular and tapering in shape, and composed of irregular units that can be likened to kegs, barrels, or buoys strung together on a line, and which can sometimes sport a large protuberance resembling a spike or other notable structure. And in terms of behaviour, the composite UMO, when not lying motionless and oblivious on the surface or engaged in submerging or throwing portions of its extended body up into the air, is most frequently observed to be capable of rapid locomotion achieved by undulating movements that produces a notable wake.

It is my belief that the interpretation of the sea serpent sightings documented in the present article can be parsimoniously explained as evidence for entanglement of cetaceans in fishing gear or other maritime debris. However, it is worth echoing the cautionary statement by Paxton concerning the tentative nature of any conclusions drawn from eyewitness accounts due to inherent vagaries in the chain progressing from the presence of a phenomenon, to the act of its observation, to the memory and then the recording of the event.[70] To confirm this one does not have to look further than some famous legal cases wherein contentious interpretations of eyewitnesses can exist in relation to viewing the same events.

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66. Elizabeth Farma, 'Debunking a Great New England Sea Serpent', *Sea Monster Week*, www.tor.com/2012/08/16 [accessed 23 December 2015]. See Table 2 for an expanded listing of all such anecdotes.
67. France, *Disentangled*.
68. C. G. M. Paxton, 'The Plural of "Anecdote" Can be "Data": Statistical Analysis of Viewing Distances in Reports of Unidentified Large Marine Animals 1758–2000', *Journal of Zoology*, 279, (2009), 381–7.
69. France, *Disentangled*.
70. Paxton, 'Plural of "Anecdote"'.

Table 1. Descriptions of the imagined sea serpent observed between 1815 and 1819 in Gloucester harbour and elsewhere in New England, as extracted from numerous sources, and clearly indicative of a marine animal entangled in fishing gear or other maritime debris.

'… his appearance in this situation was like a string of buoys. I saw perhaps thirty or forty of those protuberances and bunches, which were about the size of a barrel.'
'… looked like the buoys of a seine.'
'… with a good glass [I saw what] seemed like gallon kegs tied together.'
'His body when out of the water looks like the buoys of a net, or a row of kegs, or a row of large casks.'
'… of the size of a barrel about the body, which … are so prominent, that they resembled buoys attached to each other.'
'[The body] appears in joints like wooden buoys on a net rope almost as large as a barrel, that the musket balls appear to have no effect on it, that it appears like a string of gallon kegs.'
'… as he moved he looked like a row of casks following in a right line.'
'He appears to be full of joints and resembles a string of buoys on a net rope, as is set in the water to catch herring. Others describe him as like a string of water casks … Two [musket] balls were thought to hit his head, but without effect.'
'… resembled the link of a chain.'
'… and his back appeared to be composed of bunches or humps, apparently as large as, or a little larger than a half barrel … The first view I had of him appeared like a string of empty barrels tied together, rising over what little swell of the sea there was.'
'The back was composed of bunches about the size of a flour barrel, which were apparently about three feet apart … and looked like a string of casks or barrels tied together.'
'The body, which is formed into parallel rings, which—when he is on the top of the water—are so prominent, that they resembled buoys attached to each other.'
'… and to seem jointed, or like a number of buoys or casks following each other in a line.'
'… the curvature and bunches on his back. To some he appeared jointed, or like a string of kegs or buoys connected on a rope.'

Longevity of nineteenth-century hemp

Cordage production extends back to the Paleolithic, and for maritime uses, to the fourth millennium BCE.[71] During the age of sail, hemp (*Cannabis sativa*) and then later abaca or manila hemp (*Musa textilis*) were the mainstay in all maritime operations, with ships carrying many miles of such material.[72] So insatiable was the navy's need for hemp, that in sixteenth-century England, farmers could be fined for not setting aside a portion of their fields to grow the plant.[73] In particular, the use of hemp in fishing nets (Figure 6), grew substantially throughout the nineteenth century,[74] and it was not until the 1950s to

71. Jennifer McCaskill, 'Conserving Waterlogged Rope: A Review of Traditional Methods and Experimental Research with Polyethylene Glycol' (Unpublished MA thesis, Texas A&M University, 2009).
72. James C. Wilcocks, *The Sea-Fisherman, Comprising the Chief Methods of Hook and Line Fishing in the Seas, and Remarks on Nets, Boats, and Boating* (London, 1884); George Brown Goode and others, *The Fisheries and Fishery Industries of the United States* (Washington, DC, 1884).

Table 2. Observed physical and behavioural attributes of the purported Gloucester sea serpent, which was almost certainly a misidentified entangled marine animal, ordered from top to bottom in relation to diminishing incidence of occurrence from 70 eyewitness testimonies, and identification of numbered anecdotes from this article concerning reported or reputed large cetaceans, which are in concordance.

Attributes	Anecdote numbers
Body composed of a series of irregular component parts	2, 3, 7, 10, 13, 14
Considerable (> 40–50 feet) length	1, 2, 3, 4, 7, 9, 15, 16, 19, 20, 25
Rapid speed of movement	2, 4, 6, 7, 17, 20
Great flexibility of body	2, 20, 23
Body components likened to kegs or barrels	2, 16, 23
Overall body likened to a string of kegs or buoys	12, 23
Large trailing wake	3, 17
Floating motionless on water	15
Oblivious of surroundings or impervious to disturbance	1, 14
Vertical undulating movement of body segments	2, 4, 20
Narrow, tapering, sinuous shape, often with absence of a tail or lateral appendages	1, 2, 3, 4, 5, 6, 13, 16, 20, 24, 25, 26, 27
Extended body pulled down into water, thrown up into air, or thrashed about on the surface	2, 4, 5, 10, 11, 12, 21, 24, 25, 27
Presence of horn, spike, mane or other protuberance	4, 14, 15, 18, 23

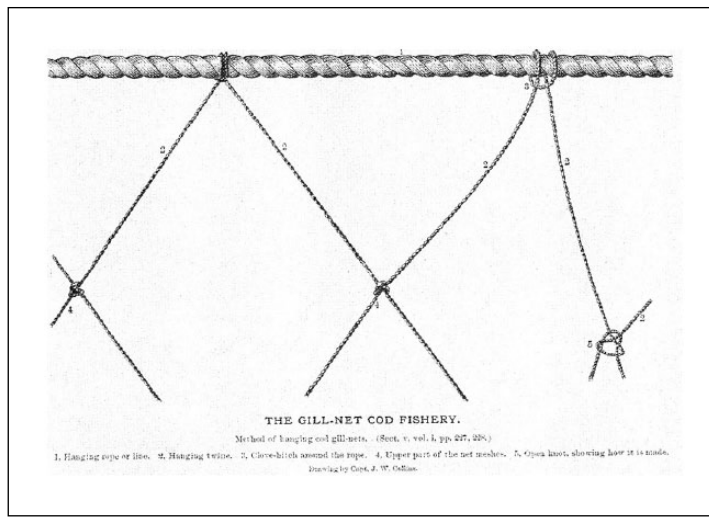
THE GILL-NET COD FISHERY.
Method of hanging cod gill-nets. (Sect. v, vol. i, pp. 217, 218.)
1. Hanging rope or line. 2. Hanging twine. 3. Clove-hitch around the rope. 4. Upper part of the net meshes. 5. Open knot, showing how it is made.
Drawing by Capt. J. W. Collins.

Figure 6. Detail of nineteenth-century gill-net constructed entirely of hemp.
Source: George Brown Goode and others, *The Fisheries and Fishery Industries of the United States* (Washington, DC, 1884).

Figure 7. The laborious reparation of hemp nets was an ongoing and necessary chore in the nineteenth-century fishing industry.
Source: George Brown Goode and others, *The Fisheries and Fishery Industries of the United States* (Washington, DC, 1884).

1970s (depending on the region) that synthetic materials became dominant in the construction of ropes and fishing nets.[75]

Natural fibre ropes and nets always needed to be regularly repaired (Figure 7) due to the constant cycle of soaking and drying, swelling from salt intrusion, physical stress and fatigue, weakening from sunlight, and microbial activity.[76] But it would be wrong to believe that 'these products broke down quickly in the marine environment' and thus were incapable of entangling animals.[77] Hemp actually becomes 'stronger when wet and does not rot easily in water', owing to the hydroscopic nature of the fibre.[78] Also, hemp ropes were often impregnated with dye, as a mordant, or pine tar to slow down their rate of deterioration.[79] Under certain conditions, such as in the hulls of wrecks buried in sediment, hemp ropes can survive for centuries.[80]

73. McCaskill, 'Conserving Waterlogged Rope'.
74. W. Jeffrey Bolster, *The Mortal Sea: Fishing the Atlantic in the Age of Sail* (Cambridge, MA, 2012).
75. H. Kristjonsson, *Modern Fishing Gear of the World 3: Fishing Gear, Purse Seining, Aimed Trawling* (Rome, 1971); T. Bekker-Nielsen and D. B. Casola, eds., *Ancient Nets and Fishing Gear* (Aarhus, 2010).
76. McCaskill, 'Conserving Waterlogged Rope'.
77. NOAA, MD, *Report*, 2.
78. McCaskill, 'Conserving Waterlogged Rope'.
79. Bekker-Nielsen and Casola, eds., *Ancient Nets*; Jeanette M. Cardamone, 'The Aging, Degradation, and Conservation of Historic Materials Made From Cellulosic Fibres', in J. M. Cardamone and M. T. Baker, eds., *Historic Textiles, Papers, and Polymers in Museums* (Washington, DC, 2001).
80. McCaskill, 'Conserving Waterlogged Rope'; Bekker-Nielsen and Casola, eds., *Ancient Nets*.

The tensile strength and longevity of wetted rope can increase up to 20 per cent and extend well beyond a year given proper treatment with preservatives.[81] Synthetic ropes that absorb water actually lose about the same amount of tensile strength, and in certain circumstances, ropes made of manila hemp can have a durability equal to or exceeding those made of nylon or polyethylene.[82] Indeed, the rise in popularity of manila hemp during the nineteenth century was particularly due to its natural oils providing resistance to deterioration, thereby eliminating the need for tarring to prevent rot.[83] In some cases, hemp ropes were even reinforced with braided wire.[84]

Although water- and air-exposed ropes made from treated natural fibres in the nineteenth century will have generally deteriorated more rapidly than modern ropes constructed of synthetic material, the former obviously had enough longevity to justify their continued maritime use. It is my contention that any rope and net material of a durability as to be useful to the needs of fishermen or mariners will have been available, possibly in the form of drifting ghost nets, to become entangled on a whale. Today, it is known that the non-lethal entanglement of specifically recognized cetaceans can last for years.[85] It is possible that entanglement in the nineteenth century may have lasted, if not for half a decade or longer as today due to plastic, at least for a duration of months, and possibly several years. This would certainly have been sufficient time for the unfortunate whale to have been witnessed and misidentified as, or construed to be in battle with, a sea serpent. For the former, a whale pulling a string of buoys (Figure 8), which during the nineteenth century shifted from being blown-glass balls to much larger cork floats and even barrels and casks,[86] through the water, could easily be misidentified as the undulating motions of a supposed sea serpent.

Evidence for widespread, pre-plastic entanglements

The most witnessed and most thoroughly investigated sea serpent sighting in history, that of the UMO visiting Gloucester and New England in the second decade of the nineteenth century,[87] was almost certainly an example of early entanglement (Table 1).[88] I believe that the evidence contained within the anecdotes and drawings in present article suggests that it is not a reach to propose that a case can be made for nineteenth-century cetaceans around the world also demonstrating a susceptibility to becoming entangled in anthropogenic material.

The present investigation therefore suggests that it is incorrect to consider entanglement of whales in fishing gear or maritime debris as being only a recent phenomenon

81. W. R. G. Aiken and J. Purser, 'The Preservation of Fibre Ropes for Use in Sea-Water', *Plymouth Laboratory New Series*, 20 (1936), 643–56.
82. Kristjonsson, *Modern Fishing Gear*.
83. McCaskill, 'Conserving Waterlogged Rope'.
84. Goode and others, *The Fisheries*.
85. J. L. Neilson, J. M. Straley, C. M. Gabriele and S. Hills, 'Non-lethal Entanglement of Humpback Whales (*Megaptera novaengliae*) in Fishing Gear in Northern Southeast Alaska', *Journal of Biogeography*, 36 (2009), 452–64.
86. Bolster, *The Mortal Sea*.
87. Soini, *Gloucester's Sea Serpent*.

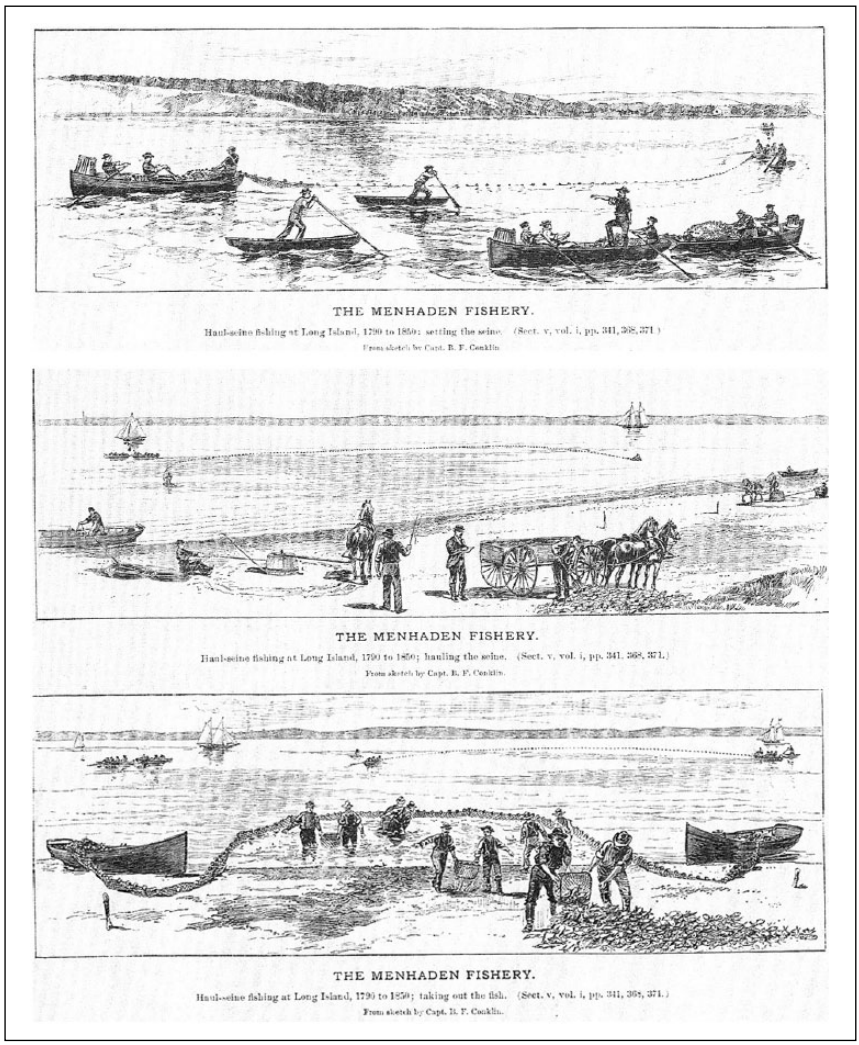
THE MENHADEN FISHERY.
Haul-seine fishing at Long Island, 1790 to 1850; setting the seine. (Sect. v, vol. i, pp. 341, 368, 371.)
From sketch by Capt. B. F. Cooklin.
THE MENHADEN FISHERY.
Haul-seine fishing at Long Island, 1790 to 1850; hauling the seine. (Sect. v, vol. i, pp. 341, 368, 371.)
From sketch by Capt. B. F. Cooklin.
THE MENHADEN FISHERY.
Haul-seine fishing at Long Island, 1790 to 1850; taking out the fish. (Sect. v, vol. i, pp. 341, 368, 371.)
From sketch by Capt. B. F. Cooklin.

Figure 8. One of the many methods of nineteenth-century fishing: haul-seining for menhaden. Upper panel shows deployment of the net, middle panel depicts hauling in the seine with use of shoreline winches, and lower panel illustrates emptying the catch from the net. Note the second seine-net being set in the background of the latter two panels. It is not difficult to imagine how a distant view of the floats of such a net that had become non-lethally entangled on a swimming whale during the process of active setting (see Anecdotes 18 and 19 in text) or following abandonment, might be construed as being an enormous, undulating sea serpent if it was dragged along, bobbing up and down, over the surface of the water.
Source: George Brown Goode and others, *The Fisheries and Fishery Industries of the United States* (Washington, DC, 1884).

restricted to our age of plastic, rather than being a stress with a much more lengthy environmental history. The decline, and in some cases, extirpation, of marine mammal

populations over the last four hundred years has primarily been through a consequence of non-sustainable, exploitative hunting.[89] Added to this, though no doubt of a much less significant nature in terms of ultimate deleterious impact, it may very well be that ever since humans have been placing fishing nets and associated maritime equipment into the ocean, whales will have been susceptible to becoming caught up in the hemp ropes that have fastened together such paraphernalia.

Furthermore, with respect to the whaling industry itself, even with the use of explosive harpoons, large cetaceans can survive for extended periods,[90] and in pre-ballistic times, as many as a quarter of all struck whales actually managed to evade capture,[91] as witness to the following account from the noted polar explorer Fridtjof Nansen, who had lost a small dory to an escaping whale:

> I felt pretty sore at losing such a good boat. Well I wasn't going to risk another boat, but I thought I'd be even with him all the same. Next year I took some petroleum casks with me. I rigged up three of these casks, fixing them on to three new whale-lines, and laid them all ready at the bottom of the boat. Then we started out again. Well, I made fast to a fish [i.e. a whale], and down he went in the same way. The first line ran right out and we chucked the first cask overboard. But he pulled it on down with him full pelt as before, without stopping a moment … Then the second line ran out, and we chucked the second cask into the water, but it just went after the first and disappeared in the same non-stop fashion; while the third line went running out as fast as though we hadn't had any casks at all. At length we chucked the last cask overboard; but I'll be handed if it didn't go under every bit as quick as the others. So we'd lost the whale and the lines and the casks, and we never saw them again.[92]

One wonders if the next person who spotted this particular whale, pulling along its three intertwined ropes with large casks behind, imagined that he or she had caught a glimpse of the elusive sea serpent.

It may seem remarkable that so many nineteenth-century eyewitnesses failed to identify trailing gear or debris in their sightings. However, one has only to go online today (e.g. www.petethomasoutdoors.com/boating/page/6/; May 29, 2012, 'Rescue team frees entangled gray whale off Palos Verdes') to find photographs showing whales pulling long lines of entangled gear, such as widely separated buoys or floats, to see how these unnaturally elongated UMOs could be considered by the uninformed to be very different from whales. Remove the use of telephoto lenses from today's photographic efforts or spyglasses from many eyewitness accounts in the past, and misidentifications would be, and indeed still are, commonplace. Added to this is the fact that most nineteenth-century people, even coastal dwellers, would

88. France, *Disentangled*; Farma, 'Debunking a Great New England Sea Serpent'.
89. Farley Mowat, *Sea of Slaughter* (Toronto, 1997).
90. David Gardner, 'Whale Survives Harpoon Attack 130 Years Ago to Become "World's Oldest Mammal"', *The Daily Mail*, 13 June 2007.
91. Mowat, *Sea of Slaughter*.
92. Mowat, *Sea of Slaughter*, 298–9.

have been unfamiliar with seeing whales due to the previous decimation of most species.[93] As Bolster aptly states:

> The unknown wore many guises. Unaided by technology for centuries, human senses rendered large marine animals doubly enigmatic. Before the development of diving bells and scuba masks no swimmer could view a whale completely in its natural element. And when seamen killed one, no ship had the capacity to hoist the sea's largest creatures on deck until the late nineteenth century, when naval architects and shipwrights began building monster iron ships, outfitted with steam winches and wire rope. Thus the dimensions and appearance of outlandishly large sea creatures remained wrapped in mystery.[94]

Therefore, even though entanglement has been recognized by ecologists in specialized publications from the late 1980s onward, and by the general public due to televised newscasts probably since about the turn of the new century, it is likely that many today can still be fooled into believing that they have seen an UMO, if of a cautious disposition, or a definitive sea serpent, if prone toward an overt imagination. For example, in reference to the *Pauline* sighting, Philip Hoare[95], in perhaps the most sensitive book ever written about whales, penned the following: 'I must confess I have seen whales that look like sea monsters, rolling in the waves. My childhood desire to believe in a lost world (Arthur Conan Doyle, on honeymoon in Greece, claimed to have seen a young ichthyosaur in the sea) seeks to create something palpable out of the apparently incredible; to conjure an abyssal nightmare out of the pages of scientific certainty'.

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Robert France teaches courses at Dalhousie University on watershed management, environmental theory and urban agriculture. He has undertaken conservation biology research from the High Arctic to the tropics, on organisms from bacteria to whales. Dr France's books on environmental history include *Wetlands of Mass Destruction: Ancient Presage for Contemporary Ecocide in Southern Iraq* (Green Frigate Books, 2007); *Veniceland Atlantis: The Bleak Future of the World's Favorite City* (Libri, 2010); *Profitably Soaked: Thoreau's Engagement with Water* (Green Frigate Books, 2005); *Reflecting Heaven: Henry David Thoreau on Water* (Houghton Mifflin, 2001), and the forthcoming *Disentangled: Environmental History and Explanation for the World's Most Sighted and Studied Sea Serpent*.

93. Mowat, *Sea of Slaughter*.
94. Bolster, *The Mortal Sea*, 93.
95. Philip Hoare, *The Whale: In Search of the Giants of the Sea* (New York, 2010), 225.